



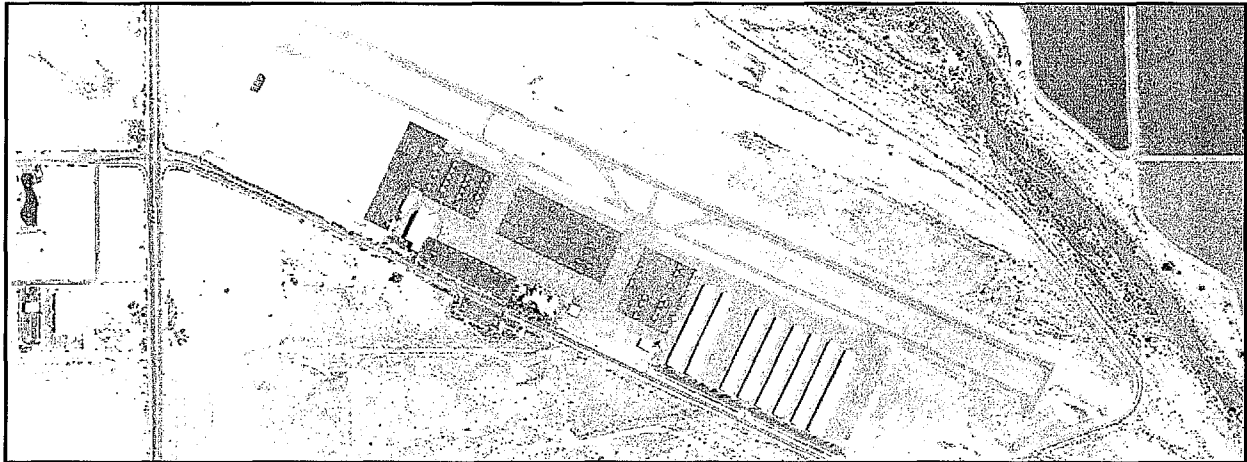
GLEND~~A~~LE

MUNICIPAL AIRPORT

Chapter One

INVENTORY

INVENTORY



The initial step in the preparation of the airport master plan update for the Glendale Municipal Airport is the collection of information pertaining to the airport and the area the airport serves. This chapter assembles collected information which will be used in subsequent analyses in this study. Within this chapter is an inventory of existing airport facilities, area airspace, and air traffic control. Additionally, background information regarding the City of Glendale and the regional area is collected. This includes information regarding the airport's role in regional, state, and national aviation systems, surface transportation, and the socioeconomic profile.

The information outlined in this chapter provides a foundation, or starting point, for all subsequent chapters. Therefore, it is essential that a complete and accurate inventory is conducted since the findings

and assumptions made in this plan are dependent on information collected. The information outlined in this chapter was obtained through on-site inspections of the airport, interviews with City staff and airport tenants, and documents provided by the Federal Aviation Administration (FAA), Arizona Department of Transportation-Aeronautics Division (ADOT), Maricopa Association of Governments (MAG), and City of Glendale.

REGIONAL SETTING

Glendale Municipal Airport is located on a 427 acre site in the western portion of the City of Glendale, approximately six miles from the City's central business core. Within the north-central portion of Maricopa County, the City of Glendale is located along the western edge of the Phoenix Metropolitan Area. The City of Glendale is surrounded by the City of

the City of Phoenix (to the east and south); Peoria, Sun City, Youngtown, El Mirage, and Luke Air Force Base (to the north and west); and Litchfield Park, Goodyear, Avondale, Cashion, and Tolleson (to the South). **Exhibit 1A** depicts the airport in its regional and national setting.

The regional climate is typical of southern Arizona - warm, dry desert. The normal daily minimum temperature ranges from 41 degrees in January to 81 degrees in July. The normal daily maximum temperature ranges from 66 degrees in January to 106 degrees in July. The region can expect approximately 7.6 inches of precipitation annually. Clear skies predominate in this climate. On average, there are 210 clear days each year, 85 partly cloudy days, and 70 days with cloudy skies. Prevailing winds are normally light at the airport where approximately 52 percent of the winds register below 3 miles per hour.

All airport facilities are accessed via Glen Harbor Boulevard which extends along the western edge of the airport site. Glen Harbor Boulevard intersects with Glendale Avenue on the north side of the airport. Glendale Avenue provides primary access to the airport from the City of Glendale. Regional access is available from Arizona Highway 101 (the Aqua Fria Expressway), Interstate Highway 10, and U.S. Highway 60. Highway 101 is located approximately one mile east of the airport. Interstate Highway 10 is located approximately 5 miles south of the airport and is accessed via 99th Avenue. An extension of Highway 101

is planned from its present intersection at Glendale Avenue and 99th Avenue to Interstate Highway 10.

The airport is bordered on the north by Glendale Avenue, the south and east by the New River, and on the west by above ground high voltage electric power lines. The Glen Harbor Industrial Park is located directly north of the airport. Open and agricultural land uses prevail to the west and east of the airport. Residential development is primarily located to the north and southeast. The 1994 Noise Compatibility Study provides a detailed discussion of land uses near the airport and nearby land use regulations.

THE AIRPORT'S SYSTEM ROLE

Airport planning exists on many levels: local, regional, state, and national. Each level has a different emphasis and purpose. This master plan is the primary local airport planning document. Regionally, the airport is included in the Maricopa County Association of Governments (MAG) *Regional Aviation System Plan (RASP)*. The *RASP* evaluates the region's capacity and ability to meet aviation demand, expanding the focus beyond the individual airports, as provided for in their respective master plans. Glendale Municipal Airport is one of 16 airports included in the *RASP* which MAG considers important to meeting the region's demand for aviation services.

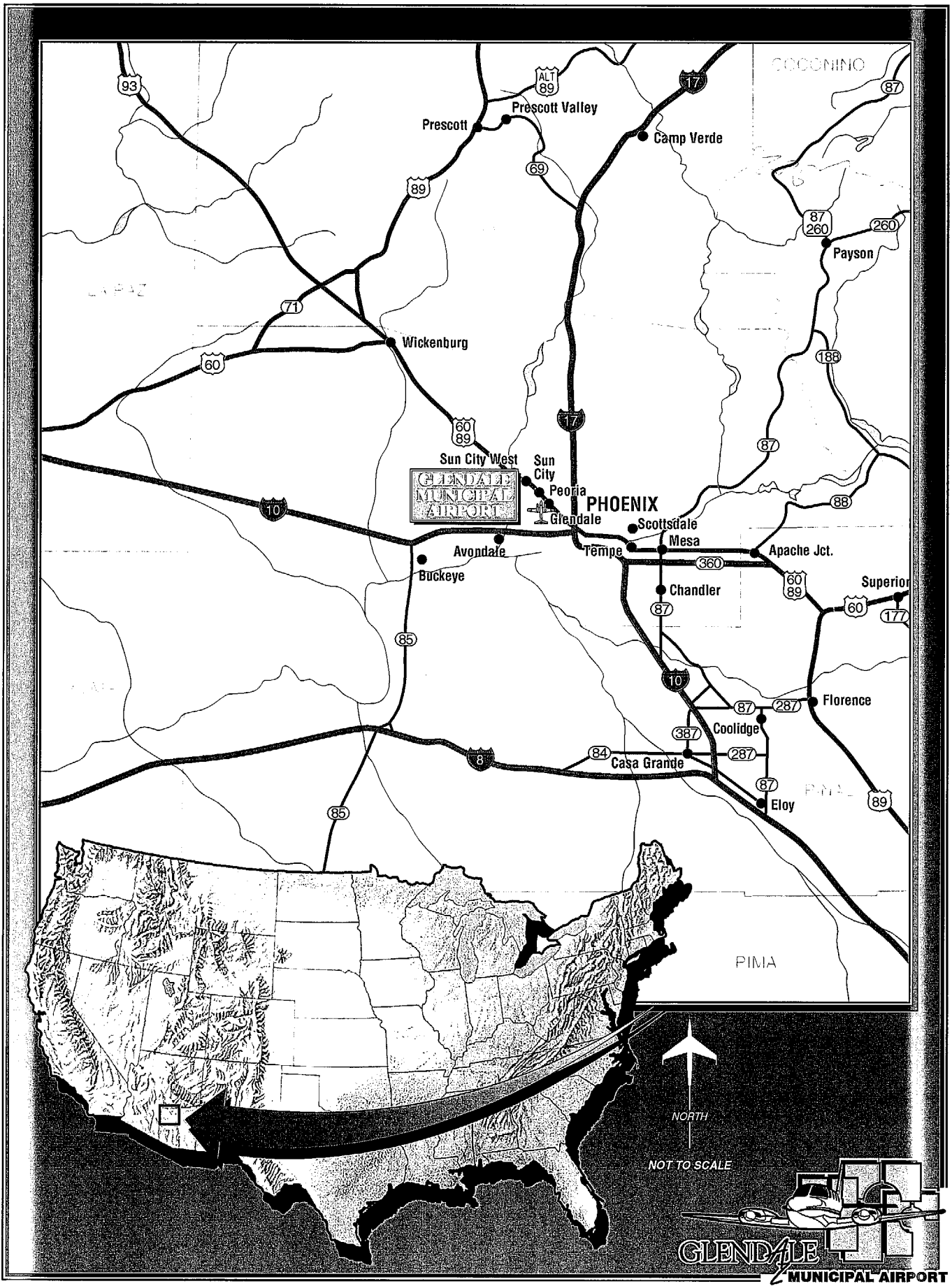


Exhibit 1A
VICINITY MAP

At the state level, the airport is included in the *Arizona State Aviation System Plan (SASP)*. The purpose of the *SASP* is to ensure that the State has an adequate and efficient system of airports to serve its aviation needs well into the 21st century. The *SASP* defines the specific role of each airport in the State's aviation system and establishes funding needs. Through the State's Continuous Aviation System Planning Process (CASPP), the *SASP* is updated every five years. The most recent update to the *SASP* is the 1995 *Arizona State Aviation Needs Study (SANS)*. The purpose of the *SANS* is to provide policy guidelines that promote and maintain a safe aviation system in the State, assess the State's airports capital improvement needs, and identify resources and strategies to implement the plan. Glendale Municipal Airport is one of 112 airports within the state's aviation system plan. The 1995 *SANS* included all public and private airports and heliports in Arizona which are open to the public, including American Indian and recreational airports.

At the national level, the airport is included in the *National Plan of Integrated Airport Systems (NPIAS)*. The *NPIAS* includes a total of 3,660 airports (both existing and proposed) which are important to national air transportation. Glendale Municipal Airport is one of forty-six general aviation airports in Arizona included in the *NPIAS*. The *NPIAS* includes estimates on the total development needs of the nation's airports which are eligible for federal funding assistance.

HISTORICAL PERSPECTIVE

The City of Glendale constructed its first municipal airport in 1971 on a 27 acre parcel of land obtained through a bankruptcy sale. Located in **what is now** the Town of Peoria, the original airport facilities consisted of a 2,300 foot-long, 75 foot-wide paved north/south runway, full-length parallel taxiway, and aircraft parking apron. In 1972, the City purchased an adjoining 13 acre parcel of land, increasing the size of the airport to 40 acres. Rapid growth coupled with restricted expansion possibilities and opposition to airport expansion required the City of Glendale to begin a search for an alternative airport site. A site analysis study completed between 1976 and 1978 concluded that the rapidly growing community precluded locating an airport near the City center and recommended a site west of the City.

In 1980, with federal and state grant assistance, the City of Glendale began the process of conducting a site selection and master plan study for a new Glendale airport. Eight potential airport sites, including the present airport site, were evaluated in the site selection process. Potential airspace conflicts with Luke Air Force Base were evaluated for the present airport site by the FAA during the site selection process. The study indicated that any potential airspace conflicts could be resolved by operating the new Glendale airport under visual flight conditions only and having an operational air

traffic control tower during periods when Luke Air Force is conducting training operations. The present airport site was supported by the Maricopa Association of Governments (MAG) during the site selection process.

Construction of existing airfield facilities began in 1983 and the airport opened for operations on June 30, 1986. The old airport site was subsequently closed and converted to private industrial uses. The City of Glendale completed the construction of the airport terminal building in 1986 and Fixed Base Operator (FBO) facilities in 1987. In the early 1990's the aircraft wash rack/maintenance bay facility was covered, the old air traffic control tower was removed and a replacement tower was relocated from Scottsdale Airport, and a nondirectional beacon (NDB) was installed on the east side of the airport. In 1994, the apron was expanded to the north. A helipad was constructed on the south side of the terminal in 1995 and a reserve banquet area within the terminal/administration building was converted to office space.

In 1997, with federal and state grant assistance, the City of Glendale completed a number of airport improvement projects. This includes the purchase of approximately 59 acres of land along the northeast side of the airport as detailed in the Noise Compatibility Study; the purchase of property southeast of the airport in the proposed Camelback Ranch subdivision; the grading, paving, and extension of utilities to the undeveloped area north of the FBO hangar along Glen Harbor Boulevard for the private development of aircraft storage hangars; the

construction of taxiway south of the existing shade and T-hangars for the private development of aircraft storage hangars; the construction of a taxiway south of the terminal/administration building to provide access to privately developed commercial general aviation facilities which will provide various general aviation services such as avionics and aircraft interior repair; and the construction of a 5,000 square foot airport maintenance facility adjacent to the covered aircraft wash facility.

AIR TRAFFIC ACTIVITY

At airports serving general aviation, the number of based aircraft and the total annual operations (takeoffs and landings) are the primary indicators of aeronautical activity. These indicators will be used in subsequent analyses in this master plan update to project future aeronautical activity and determine future facility needs.

BASED AIRCRAFT

The total number of based aircraft and type of aircraft based at the airport since the airport opened in 1986 has been summarized in **Table 1A**. Total based aircraft have fluctuated each year since 1986. Mirroring a national trend, which has seen a decline in the total numbers of general aviation aircraft, based aircraft totals declined annually from 1990 to 1993. Based aircraft totals have since rebounded, increasing annually since 1993 and reaching a six-year high of 188 in 1996. Single engine aircraft make up the majority of aircraft based at the airport.

TABLE 1A
Historical Based Aircraft
Glendale Municipal Airport

Year	Total Based Aircraft	Single Engine	Multi Engine	Turbo Prop	Jet	Helicopter	Other ¹
1986	205	197	4	0	0	4	0
1987	209	200	6	0	0	3	0
1988	197	187	6	0	0	2	2
1989	167	159	6	0	0	2	0
1990	202	165	17	17	0	3	0
1991	167	149	10	5	0	3	0
1992	160	147	8	3	0	2	0
1993	143	135	6	0	0	2	0
1994	178	168	8	0	0	2	0
1995	184	172	5	1	0	4	2
1996	188	179	4	1	0	2	2

¹ Glider, Ultralight, Balloon

Source: Arizona Department of Transportation-Aeronautics Division (1996); Maricopa Association of Governments, *Regional Aviation System Plan Implementation Study* (1986-1995)

AIRCRAFT OPERATIONS

The air traffic control tower (ATCT) located on the airport collects information regarding aircraft operations (takeoffs and landings). **Table 1B** summarizes historical aircraft operations at the airport since 1986. Aircraft operations at the airport are categorized as either general aviation or military and further categorized as local or itinerant. General aviation operations comprise the majority of operations. Military operations consists mostly of helicopter operations from local military bases. Local operations consist mostly of aircraft training operations conducted within the aircraft traffic pattern and touch-and-go operations. Itinerant operations are originating or departing aircraft which are not conducting

operations within the airport traffic pattern.

Aircraft operations at the airport increased from 1986 to 1990, peaking at 151,000 operations in 1990. Operations have since declined, falling to 118,000 in 1996 after increasing slightly in 1995. Local general aviation operations comprise the majority of all operations at the airport, reflecting the large level of training activity in the Phoenix area.

AIRPORT FACILITIES

Airport facilities can be functionally classified into two broad categories: airside and landside. The airside category includes those facilities directly associated with aircraft

operations. The landside category includes the facilities necessary to provide the transition from surface to

air transportation and support facilities necessary for the safe operation of the airport.

TABLE 1B
Historical Aircraft Operations
Glendale Municipal Airport

Year	Total Operations	Local General Aviation Operations	Itinerant General Aviation Operations	Local Military Operations	Itinerant Military Operations
1986 ¹	33,855	21,190	12,665	0	0
1987	73,685	46,480	26,512	368	325
1988	93,067	59,251	33,712	44	60
1989	145,300	104,235	40,688	90	287
1990	151,662	108,933	42,567	102	60
1991	136,672	95,928	40,713	8	23
1992	112,837	76,193	36,614	4	26
1993	113,889	77,021	36,868	0	0
1994	115,068	77,677	37,391	0	0
1995	127,323	83,961	43,158	2	202
1996	118,387	78,331	39,816	120	120

¹ June 30, 1986 to December 31, 1986

Source: Airport Records (1996), Maricopa Association of Governments, *Regional Aviation System Plan Implementation Study* (1986-1995)

AIRSIDE FACILITIES

Airside facilities include runways, taxiways, airport lighting, and navigational aids. A depiction of the airside facilities at the airport is provided on **Exhibit 1B. Table 1C** summarizes airside facility data.

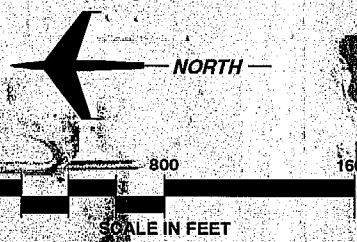
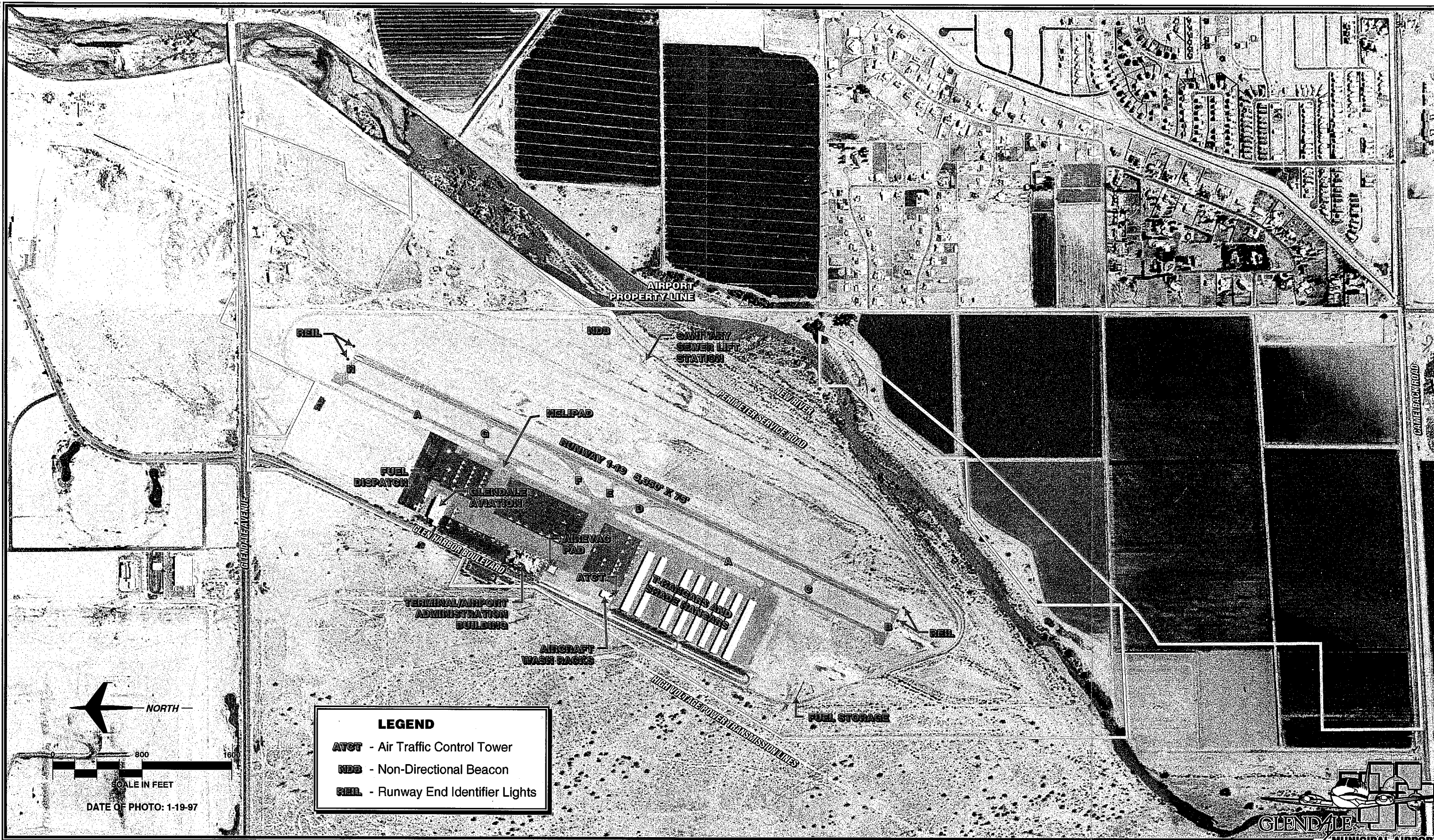
Runway

A single runway is available for use at Glendale Municipal Airport: Runway 1-19. Runway 1-19, at an elevation of 1,066 feet above mean sea level, is 5,350 feet long, 75 feet wide, and oriented in a northeast-southwest direction. Runway

1-19 is constructed of asphalt and has a load bearing strength of 30,000 pounds single wheel loading (SWL) and 37,500 pounds dual wheel loading (DWL). Single wheel loading refers to the design of the aircraft landing gear which has a single wheel on each main landing gear strut. Dual wheel loading refers to the design of certain aircraft landing gear which has two wheels on each main landing gear strut.

Taxiways

The taxiway system at the airport includes a full-length parallel taxiway and seven runway exit/entrance



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ATOT - Air Traffic Control Tower

NDB - Non-Directional Beacon

REIL - Runway End Identifier Lights



taxiways as identified on **Exhibit 1B**. Taxiway A is the full-length parallel taxiway serving Runway 1-19. Taxiway A is located 240 feet west of Runway 1-19 and measures 35 feet in width. A 920 square yard holding apron is available at the south end of Taxiway A. A 1,200 square yard holding apron is available at the north end of Taxiway A. Holding aprons provide an area off the taxiway for aircraft to prepare for departure and prevent delays to aircraft ready for departure. Taxiway B connects Taxiway A with the Runway 1 threshold and is 35 feet wide. Taxiway

C is located 815 feet from the Runway 1 threshold and is 25 feet wide. Taxiway E is located at the midpoint of Runway 1-19 and is 35 feet wide. Taxiway G is located 1,400 feet from the Runway 19 threshold and is 25 feet wide. Taxiway H connects Taxiway A with the Runway 19 threshold. Taxiways D and F are acute angle (high speed) exit taxiways and are 40 feet wide. The design of these taxiways allow aircraft to exit the runway at higher speeds than with right-angled taxiways. A series of unclassified taxiways connect the apron areas with Taxiway A.

TABLE 1C
Airside Facilities Data
Glendale Municipal Airport

		Condition
Runway Length (feet)	5,350	—
Runway Width (feet)	75	—
Runway Surface Material	Asphalt	Good
Runway Load Bearing Strength (pounds)		
Single Wheel Loading	30,000	—
Dual Wheel Loading	37,500	—
Airfield Lighting		
Identification	Rotating Beacon	Excellent/Good
Runway and Taxiway	Medium Intensity	Excellent/Good
Approach	PAPI (1 and 19)	Excellent/Good
Runway End	REIL (1 and 19), Threshold	Excellent/Good
Pavement Markings		
Runway	Visual	Excellent/Good
Taxiways, Taxilanes, Apron	Centerline, Aircraft Tiedowns, Helipad	Excellent/Good
Navigational Aids	Nondirectional Beacon (NDB)	Good

PAPI - Precision Approach Path Indicator
REIL - Runway End Identifier Lights

Airfield Lighting

Airfield lighting systems extend an airport's usefulness into periods of darkness and/or poor visibility. A variety of lighting systems are installed at the airport for this purpose. These lighting systems, categorized by function, are summarized as follows:

Identification Lighting: The location of an airport at night is universally indicated by a rotating beacon. A rotating beacon projects two beams of light, one white and one green, 180 degrees apart. The rotating beacon at the airport is located atop the air traffic control tower.

Runway and Taxiway Lighting: Runway and taxiway lighting utilizes light fixtures placed near the pavement edge to define the lateral limits of the pavement. This lighting is essential for maintaining safe operations at night and/or during times of poor visibility in order to maintain safe and efficient access from the runway and aircraft parking areas. Medium intensity pavement edge lighting is provided along Runway 1-19 and each taxiway at the airport. Runway threshold lighting identifies each runway end. The intensity of the runway and taxiway lighting can be controlled through the air traffic control tower. During periods when the air traffic control tower is closed, pilots can turn on and change the intensity of the runway and taxiway lighting utilizing the radio transmitter in the aircraft.

Visual Approach Lighting: A precision approach path indicator

(PAPI) is available at each runway end. The PAPI consists of a system of lights located near the runway threshold. When interpreted by the pilot they give him or her an indication of being above, below, or on the designed descent path to the runway.

Runway End Identification Lighting: Runway end identifier lights (REIL's) provide rapid and positive identification of the approach end of a runway. REIL's are typically used on runways with no other approach lighting systems. The REIL system consists of two synchronized flashing lights, located laterally on each side of the runway threshold facing the approaching aircraft. REIL's are installed at each runway end.

Pavement Markings

Pavement markings aid in the movement of aircraft along airport surfaces. The visual markings to Runway 1-19 identify the runway centerline, pavement edge, designation, and aircraft holding positions. Taxiway and apron taxilane centerline markings are provided to assist aircraft using these airport surfaces. Pavement markings also identify aircraft parking positions.

Helipad

A helipad is marked on the apron east of the FBO facility and is used by helicopters landing and departing at the airport. A second helicopter pad (used by an air ambulance operator based at

the airport) is located south of the terminal/administration building. This helicopter pad is restricted to hover/taxi operations only. A helicopter cannot use this helipad for landing or takeoff.

Navigation Aids

Navigation aids are electronic devices that transmit radio frequencies which properly equipped aircraft and pilots translate into point-to-point guidance and position information. The types of electronic navigational aids available for aircraft flying to or from the airport include the very high frequency omnidirectional range (VOR) facility, non-directional beacon (NDB), global positioning system (GPS), and Loran -C.

The VOR, in general, provides azimuth readings to pilots of properly equipped aircraft by transmitting a radio signal at every degree to provide 360 individual navigational courses. Frequently, distance measuring equipment (DME) is combined with a VOR facility to provide distance as well as direction information to the pilot. Military tactical air navigation aids (TACAN's) and civil VOR's are commonly combined to form a VORTAC. A VORTAC provides distance and direction information to civil and military pilots. The Buckeye and Phoenix VORTAC's can be utilized by pilots flying to or from the airport. **Exhibit 1C**, a map of the regional airspace system, depicts the location of these VORTAC's in relation to the Glendale Municipal Airport.

The NDB transmits nondirectional radio signals whereby the pilot of properly equipped aircraft can determine the bearing to or from the NDB facility and then "home" or track to or from the station. Pilots flying to or from the airport can utilize the Glendale NDB (owned by the City of Glendale) located on the airport. The NDB transmitter is located within a fenced area on the east side of the airport. The NDB is certified for use only during visual flights.

Loran-C is a ground-based enroute navigational aid which utilizes a system of transmitters located in various locations across the continental United States. Loran-C varies from the VOR and NDB as pilots are not required to navigate using a specific facility (with the VOR and NDB pilots must navigate to and from a specific VOR or NDB facility). With a properly equipped aircraft pilots can navigate to any airport in the United States.

GPS is an additional navigational aid for pilots enroute to the airport. GPS was initially developed by the United States Department of Defense for military navigation around the world. Increasingly, over the last few years, GPS has been utilized more in civilian aircraft. GPS uses satellites placed in orbit around the globe to transmit electronic signals which properly equipped aircraft use to determine altitude, speed, and navigational information. GPS is similar to Loran-C as pilots can directly navigate to any airport in the country and are not required to navigate using a specific navigational facility.

The FAA is proceeding with a program to gradually replace all traditional enroute navigational aids with GPS over the next decade. The FAA phase-out schedule for traditional navigational aids includes VOR's between 2005 and 2010, NDB's between 2000 and 2005, and Loran-C by the year 2000.

the airport is closed to arrivals when weather conditions deteriorate to a point where visual flight can no longer be conducted. The FAA is currently in the initial phases of developing GPS approaches to the airport.

Instrument Approach Procedures

Instrument approach procedures are a series of predetermined maneuvers established by the FAA using electronic navigational aids that assist pilots in locating an airport during low visibility and cloud ceiling conditions. Currently, there are no instrument approach procedures to the airport. Essentially,

LANDSIDE FACILITIES

Landside facilities include aircraft storage facilities, aircraft parking aprons, and support facilities such as fuel storage facilities. Within the discussion of landside facilities is a description of existing general aviation services and airport tenants. Landside facilities at the airport were previously identified on **Exhibit 1B**. **Table 1D** summarizes landside facility data.

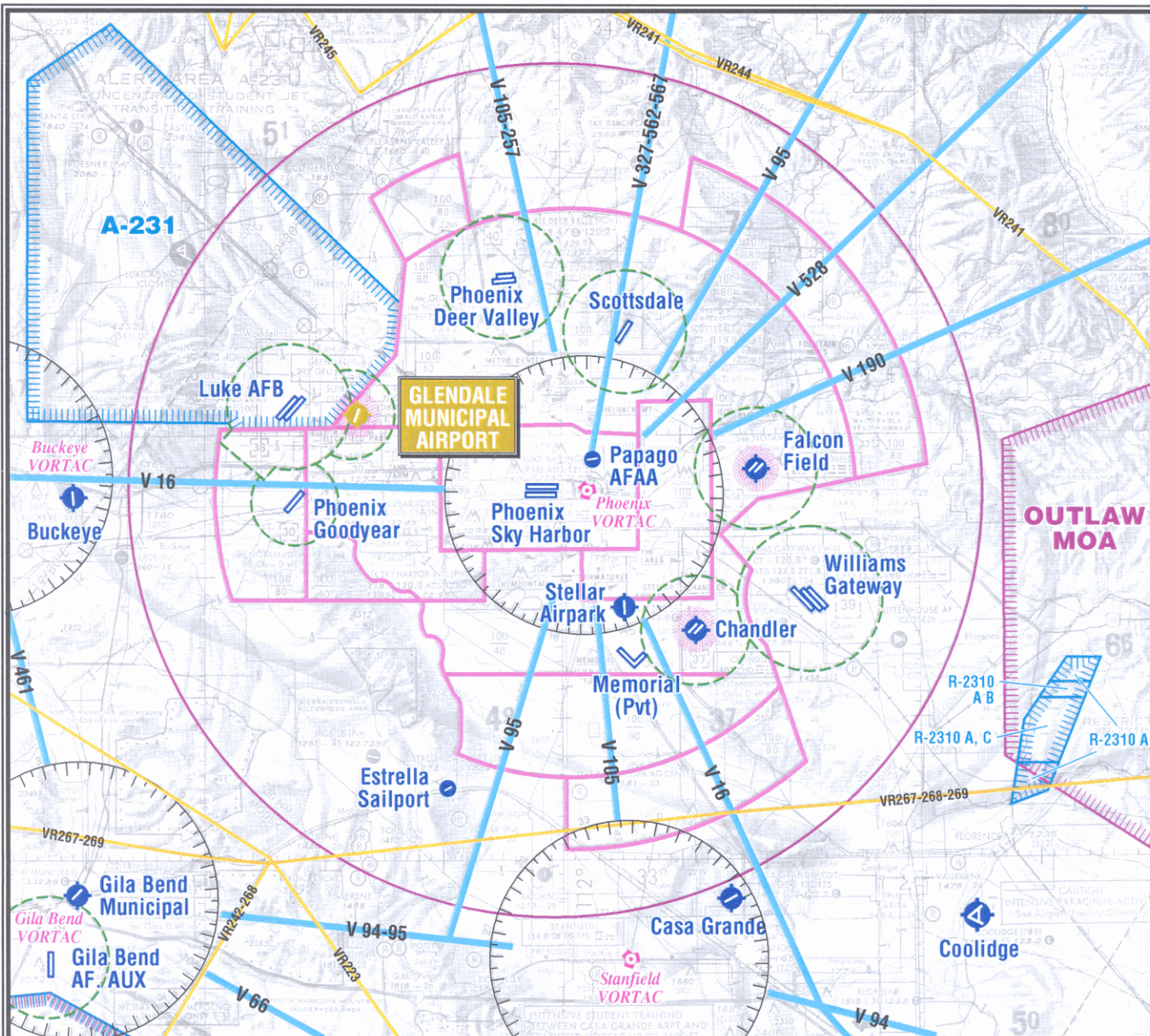
TABLE 1D
Landside Facility Data
Glendale Municipal Airport

Description	Approximate Age	Conditions
Terminal	12 years	Good/Excellent
FBO Hangar	11 years	Good/Excellent
T-Hangars	12 years	Good/Excellent
Aircraft Wash Facility	5 years	Good/Excellent
Airport Maintenance Building	New	New
Air Traffic Control Tower	5 years	Good/Excellent

Terminal Building

A two-story general aviation terminal building is located along Glen Harbor Boulevard approximately at the midpoint of Runway 1-19. The 21,900 square foot terminal building was constructed in 1986 by the City of Glendale and is in excellent condition. Located on the ground floor of the

terminal is a flight planning room, restaurant, pilot supplies shop, public lounge area, restrooms, and office space. Airport administration offices, restrooms, and additional office space is located on the second floor of the terminal building. A reserve banquet area, located on the second floor, was recently converted to office space. Four additional offices totaling approximately



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|--|---|--|---|
| | Hard-surfaced runways 1500 ft. to 8069 ft. | | Prohibited, Restricted, Warning and Alert Areas |
| | Hard-surfaced runways greater than 8069 ft. or some multiple runways less than 8069 ft. | | Military Operations Area (MOA) |
| | VORTAC | | Class B Airspace |
| | Non-Directional Radiobeacon (NDB) | | Class D Airspace |
| | Compass | | MODE C |
| | Victor Airways | | |
| | Military Training Routes | | |



NOT TO SCALE



1,410 square feet were constructed in that area. Approximately 60 vehicle parking spaces are available adjacent to the terminal building. Approximately 100 vehicle parking spaces are available in an overflow parking lot located west of Glen Harbor Boulevard. The main airport electrical vault is located adjacent to the east side of the terminal building along the aircraft parking apron. **Exhibit 1D** provides a depiction of the general aviation terminal building floorplan. The following provides a description of the businesses located in the terminal building:

Action Aviation - Aircraft rental, flight training, pilot supplies

Arnold & Arnold - Aviation insurance adjusters

J.C. Aircraft Marketing - Aircraft brokers

NARS - Sanctions air races; plans are to conduct an annual air race at the airport

Samaritan Health Services

(AirEvac) - Air ambulance services

Southwest Ambulance - Supports air ambulance services

Temple Air Service - Aircraft charter

Field Associates - Prepares audio and visual tapes for real estate

The Flightbag - Gift shop

Wings Cafe - Restaurant

Glendale Police

Apron

The apron area at the airport is constructed of asphaltic concrete and totals approximately 266,000 square yards. Located within this area are

local and transient tiedowns and shade and T-hangars. A total of 238 tiedowns are available on the apron. The City of Glendale controls 157 local tiedowns and 39 transient tiedowns. The remaining 42 tiedowns are controlled by Glendale Aviation. Apron lighting, located periodically along the aircraft tiedown positions, enhances operations at night and provides security.

Aircraft Storage Hangars

A total of 108 enclosed T-hangars and 111 shade hangar positions are available in eight buildings located south of the public terminal building. All hangars are privately owned and operated by Glendale Airport Hangars through a ground lease with the City of Glendale. All hangars are approximately 12 years old and in excellent condition. Approximately 244 vehicles can be accommodated in the parking lot that extends the full-length of the hangar area along Glen Harbor Boulevard.

Fuel Storage

Fuel storage facilities at the airport are located in a fenced facility near the south end of Glen Harbor Boulevard. A total of 28,000 gallons of fuel storage is available in four underground storage tanks. Individually, there are two 10,000 gallon storage tanks and two 4,000 gallon storage tanks. Avgas storage totals 14,000 gallons. Jet A storage totals 10,000 gallons. Automotive fuel is stored in a single 4,000 gallon tank. Glendale Aviation

operates the fuel farm through a lease with the City of Glendale. Fuel is dispensed through mobile fuel trucks owned by Glendale Aviation.

General Aviation Services

A full range of general services are available at Glendale Municipal Airport. This includes aircraft rental, flight training, aircraft maintenance, aircraft charter, aircraft fueling, and line services. Glendale Aviation, under contract with the City of Glendale, provides all line services and aircraft fueling. In addition, Glendale Aviation offers aircraft maintenance, flight training, aircraft rental, and pilot supplies. Glendale Aviation occupies the city-owned FBO facility which includes an 18,100 square foot aircraft storage and maintenance hangar and adjacent two-story office building. This building is approximately 11 years old and in excellent condition.

Action Aviation, located in the terminal building, provides aircraft rental, flight training, and pilot supplies. Action Aviation is currently negotiating with the City of Glendale for the lease of a 30,000 square foot area north of the terminal along Glen Harbor Boulevard for the development of aircraft storage and maintenance hangars and additional office and classroom space. Other terminal building tenants providing general aviation services include: Temple Air Services (aircraft charter), J.C. Aircraft Marketing (aircraft brokers), and The Flight Bag (pilot supplies).

Utilities

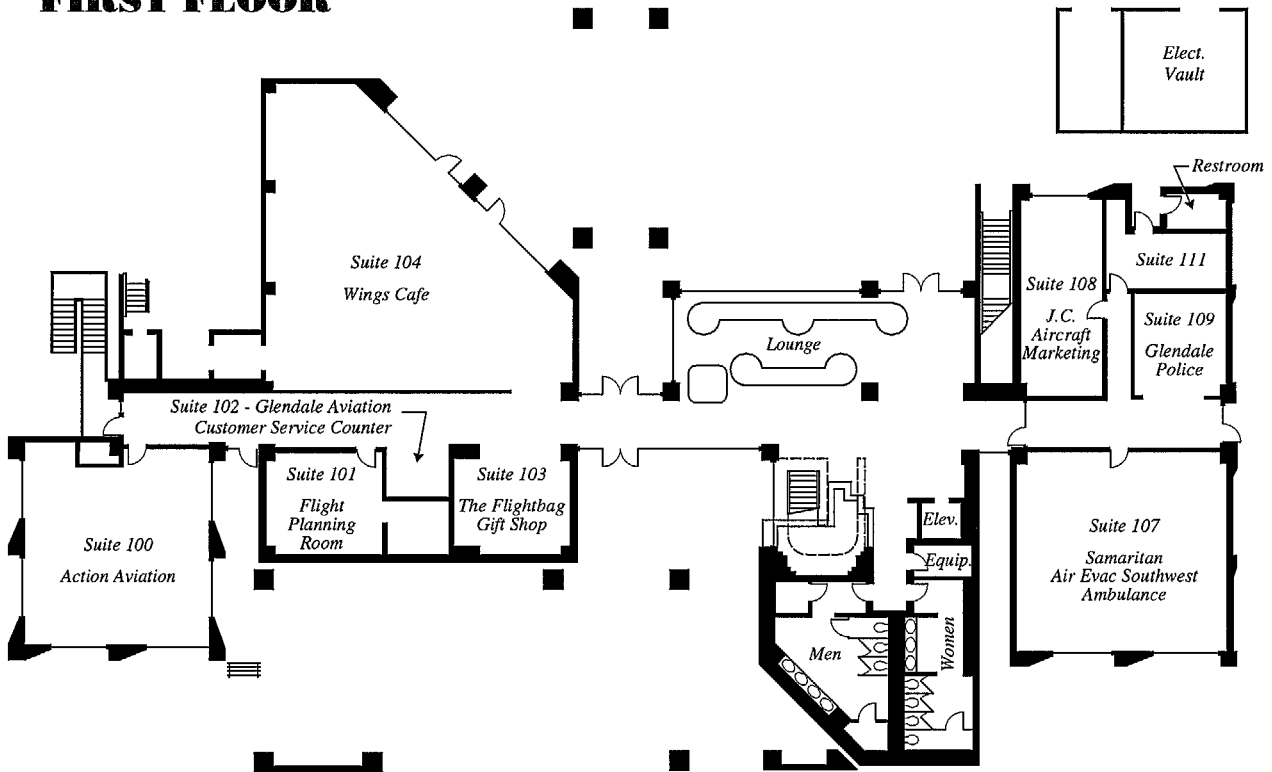
Currently, electricity, natural gas, water, and sanitary sewer services are available at the airport. Electrical service is provided by Arizona Public Service. Southwest Gas provides natural gas service. The City of Glendale provides water and sanitary sewer services. The airport was recently connected to the City of Glendale public sanitary sewer service. Previously, the airport utilized a septic tank system located east of Runway 1-19. A detailed utility map was prepared as part of this master plan study. This drawing utilized as-built drawings to locate existing utility service lines. The utility map indicates, in a single drawing, the location of all utility service lines at the airport. The utility map is included with the Airport Layout Plan at the end of Chapter Five.

There are presently no fire and rescue services located at the airport. The nearest fire station is located near Glen Harbor Boulevard and Northern Avenue and can respond to airport emergencies within approximately five minutes. Current City of Glendale plans include developing a fire station near the airport. An exact site has not been determined.

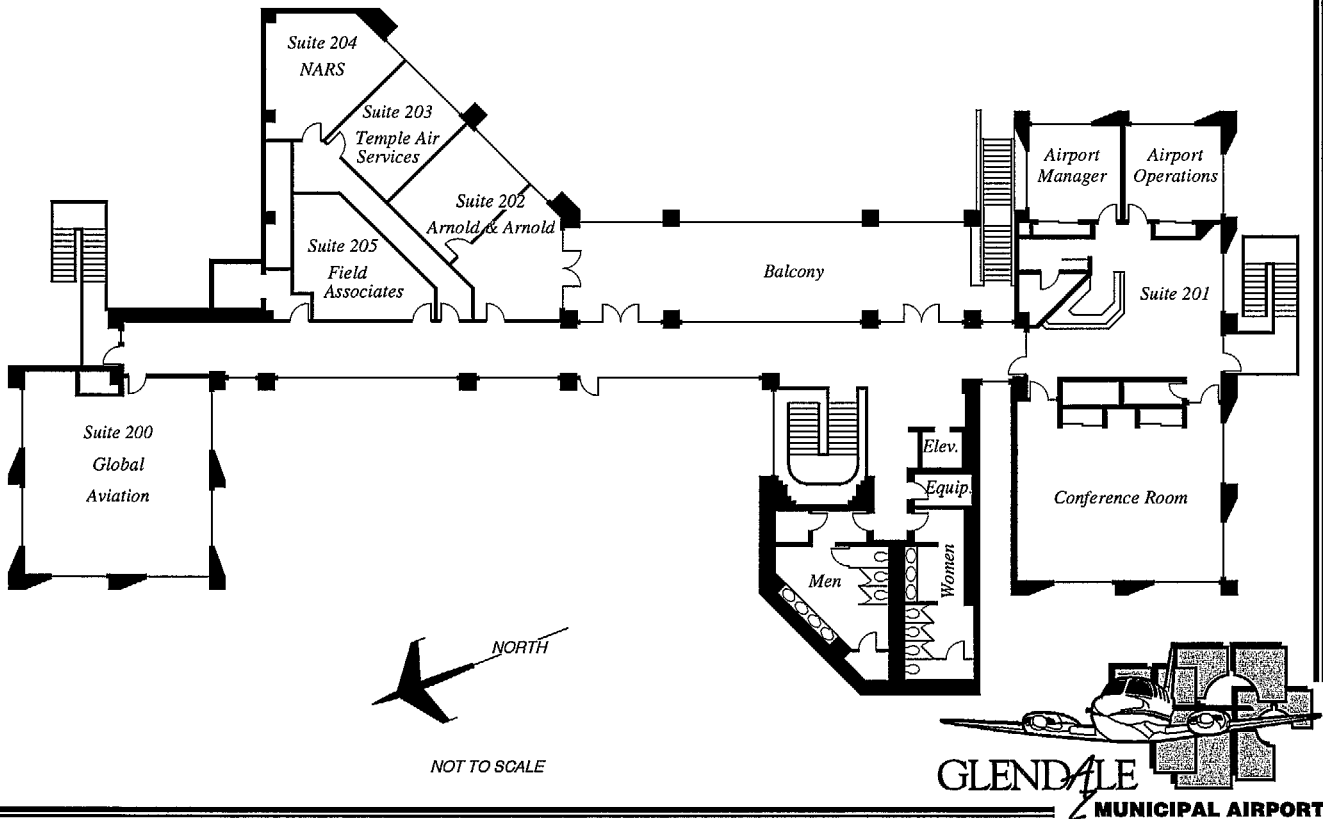
Airport Administration

Day-to-day administration and management of the airport is the responsibility of an airport manager. The airport staff includes maintenance/operations personnel and an administrative assistant. Admini-

FIRST FLOOR



SECOND FLOOR



GLENDAL
MUNICIPAL AIRPORT

strative and financial oversight of the airport is the responsibility of the Glendale City Council with guidance and direction provided by an eight member Airport Advisory Committee, appointed by the Glendale City Council.

VICINITY AIRSPACE, AIR TRAFFIC CONTROL, AND AIRPORTS

VICINITY AIRSPACE

To ensure a safe and efficient airspace environment for all aspects of aviation, the FAA has established an airspace structure that regulates and establishes procedures for aircraft using the National Airspace System. The U.S. airspace structure provides for two basic categories of airspace, controlled and uncontrolled, and identifies them as Classes A, B, C, D, E, and G.

Class A airspace is controlled airspace and includes all airspace from 18,000 feet mean sea level (MSL) to Flight Level 600 (approximately 60,000 feet MSL). Class B airspace is controlled airspace surrounding high activity commercial service airports (i.e. Phoenix Sky Harbor International Airport). Class C airspace is controlled airspace surrounding lower activity commercial service and some military airports. Class D airspace is controlled airspace surrounding airports with an air traffic control tower. All aircraft operating within Class A, B, C, and D airspace must be in contact with the air traffic control facility responsible for the particular airspace. Class E airspace is controlled airspace that encompasses all

instrument approach procedures and low altitude federal airways. Only aircraft conducting instrument flights are required to be in contact with air traffic control when operating in Class E airspace. While aircraft conducting visual flights in Class E airspace are not required to be in radio communication with air traffic control facilities, visual flight can only be conducted if minimum visibility and cloud ceilings exist. Class G is uncontrolled airspace. **Exhibit 1E** provides a depiction of the U.S. Airspace Structure.

Airspace in the vicinity of the airport is impacted by the number of airports and the high level of aircraft activity in the Phoenix metropolitan area. Airspace in the vicinity of Glendale Municipal Airport is depicted on **Exhibit 1C**. The airport is located within Class D airspace. This Class D airspace for Glendale Municipal Airport extends seven nautical miles to the east, north, and south, and approximately three miles to the west where it terminates at the Luke AFB Class D airspace. The Glendale Municipal Airport Class D airspace extends from the surface to 3,100 feet MSL. During periods when the control tower is not active the Class D airspace surrounding Glendale Municipal Airport reverts to Class E airspace.

The airport is located under the Class B airspace surrounding Phoenix Sky Harbor International Airport. The Class B airspace surrounding Phoenix Sky Harbor International Airport provides for areas of controlled airspace along primary arrival routes to the airport. The boundaries of the Class B

airspace vary to provide for operations to surrounding suburban airports. The Class B airspace extends from the surface to 10,000 feet near the airport. The floor of the Class B airspace gradually increases outward from the airport which allows for aircraft operations under the Class B airspace. An area of Class E airspace surrounds the entire Phoenix Metropolitan Area.

The airport borders a large alert area associated with Luke AFB. Within the boundaries of Alert Area A-231 there is a large concentration of military jet aircraft training. While general aviation flights are not restricted within this area, pilots are strongly cautioned to be alert for high speed military jet training aircraft.

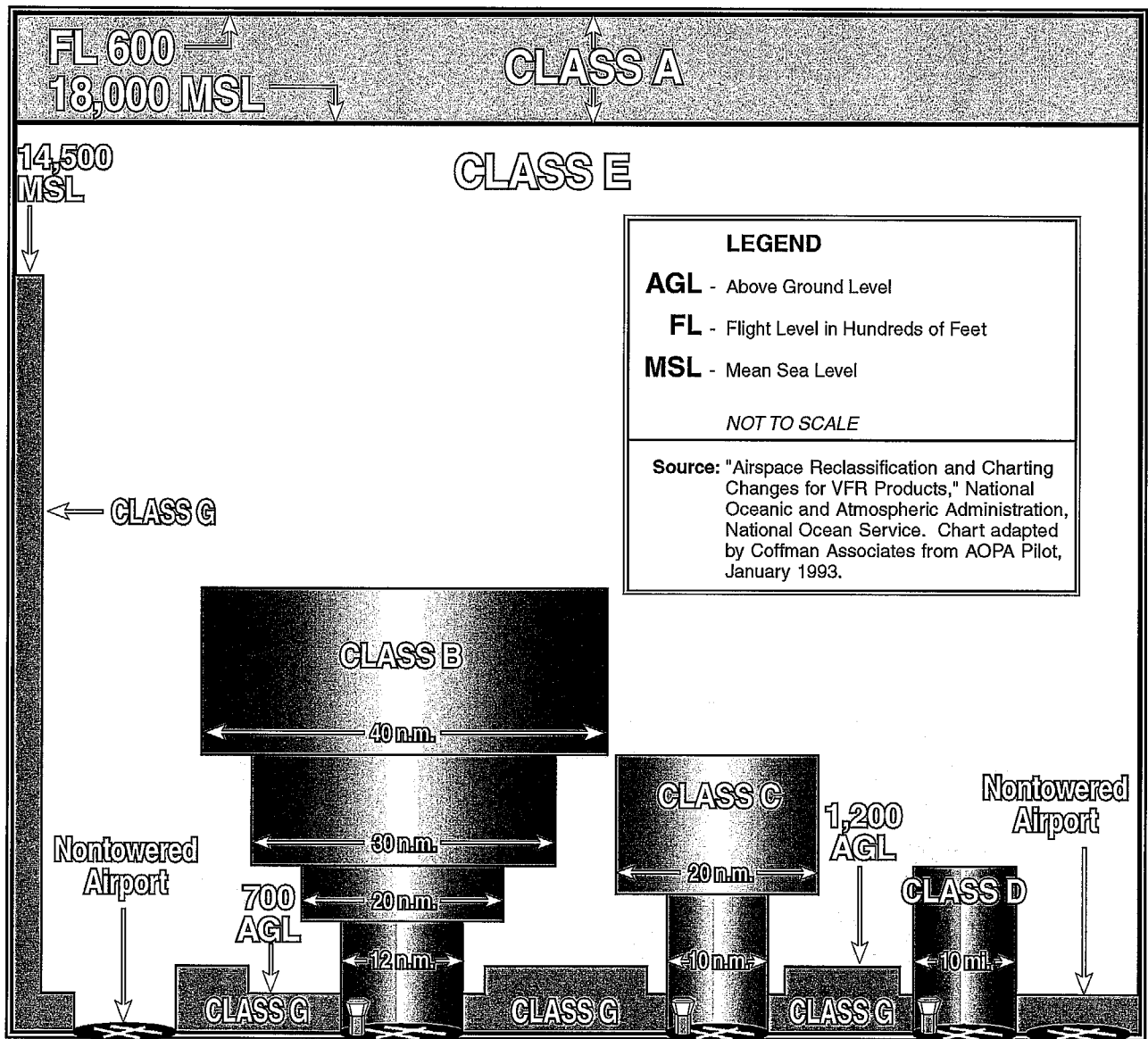
For aircraft enroute or departing the Phoenix metropolitan area using VOR navigational facilities, a system of Federal Airways, referred to as Victor Airways, has been established. Victor airways are corridors of airspace eight miles wide that extend upward from 1,200 feet MSL to 18,000 feet MSL and extend between VOR navigational facilities. All Victor Airways in the Phoenix metropolitan area emanate from the Phoenix VORTAC and are identified on **Exhibit 1C**.

AIR TRAFFIC CONTROL

The complexity of the airspace in the Phoenix area produces several levels of air traffic control. Aircraft operating within the Class D airspace surrounding the airport are controlled by air traffic control personnel located

on the airport. The air traffic control tower (ATCT) at the airport is located near the aircraft wash facility. The ATCT operates from 6:00 a.m. to 8:00 p.m. Monday through Friday and from 7:00 a.m. to 7:00 p.m. on weekends. Air traffic control services at the airport are provided at the airport by Barton ATC International, Inc. through a contract with the FAA. The tower directs all aircraft operating in the airport traffic pattern. The aircraft traffic pattern is located on the east side of the runway to avoid the high voltage power lines running on the west side of the airport. The tower also directs aircraft in complying with the adopted noise abatement procedures recommended by the *1994 Noise Compatibility Study*. The existing ATCT was relocated to Glendale Municipal Airport in 1992 from Scottsdale Municipal Airport. The tower cab floor is 45 feet high. Tower personnel indicate no visibility problems from the present tower location.

Aircraft operating within the Class B airspace surrounding the Phoenix Sky Harbor International Airport east of the airport are controlled by the Phoenix Terminal Radar Approach Control (TRACON) facility located at the Phoenix Sky Harbor International Airport. Aircraft operating west of the airport, which are in contact with air traffic control, are handled by the Luke AFB Radar Approach Control (RAPCON) facility located on Luke AFB. Aircraft arriving or departing the Phoenix metropolitan area are controlled by the Albuquerque Air Route Traffic Control Center (ARTCC). The Albuquerque ARTCC controls aircraft in a large multi-state area.



LEGEND

AGL - Above Ground Level

FL - Flight Level in Hundreds of Feet

MSL - Mean Sea Level

NOT TO SCALE

Source: "Airspace Reclassification and Charting Changes for VFR Products," National Oceanic and Atmospheric Administration, National Ocean Service. Chart adapted by Coffman Associates from AOPA Pilot, January 1993.

CLASSIFICATION	DEFINITION
CLASS A	Generally airspace above 18,000 feet MSL up to an including FL 600 .
CLASS B	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports.
CLASS C	Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control.
CLASS D	Generally airspace from the surface to 2,500 feet AGL surrounding towered airports.
CLASS E	Generally controlled airspace that is not Class A, Class B, Class C, or Class D.
CLASS G	Generally uncontrolled airspace that is not Class A, Class B, Class C, Class D, or Class E.



VICINITY AIRPORTS

There are a number of airports of various sizes, capacities, and functions within and just outside of the airport service area as indicated on **Exhibit 1C, Area Airspace**. Generally, airports which have any significant influence on Glendale Municipal Airport are in approximately a 30 nautical mile range. The airports described below are those within approximately 30 nautical miles of Glendale Municipal Airport or are important to the airspace and control environment of the area. Information pertaining to each airport was obtained from the *MAG RASP Implementation Study* (1996) and FAA's 5010-1, Airport Master Record forms.

Sky Harbor International Airport is located 17 nautical miles southeast of the Glendale Municipal Airport in the heart of Phoenix. The airport is owned and operated by the City of Phoenix and is the largest air carrier airport within the State of Arizona (and only jet air carrier airport within the Phoenix area). Sky Harbor is served by all of the major airlines with Southwest and America West utilizing the airport as a hub. In 1995, the airport ranked as the tenth busiest domestic airport with over 13.7 million passenger enplanements.

Phoenix Sky Harbor International Airport is equipped with two parallel runways over 10,000 feet in length. An array of instrument approach aids, including an instrument landing system (ILS), aid pilots on approach during inclement weather conditions. The airport is served by seven published instrument approaches with the ILS 8

approach certified for Category I weather minimums (200 foot cloud ceiling and one-half mile visibility).

Although the airport's primary role is to provide commercial service to the area, the airport also serves general aviation activity. The airport has approximately 283 based aircraft including seven jets and eight helicopters. FBO services and aircraft tie-down and hangar storage is also provided.

Estrella Sailport is situated 28 nautical miles southeast of Glendale Municipal Airport. The public use airport is privately owned and provides four unpaved runways (three of which are parallel runways). An estimated 98 aircraft (including 80 single engine, three multi-engine, and 15 gliders) are based at the airport.

Phoenix Deer Valley Airport is located 14 nautical miles northeast of Glendale Municipal Airport. Owned and operated by the City of Phoenix, the airport is served by parallel runways with Runway 7R-25L providing the greatest runway length at 8,200 feet. Approximately 803 aircraft are based at the airport, including four business jets and seven helicopters. The airport is served by an air traffic control tower and provides a full range of FBO services.

Phoenix Goodyear Municipal Airport, is located 8 nautical miles to the south of Glendale Municipal Airport and is owned and operated by the City of Phoenix. Runway 3-21 is 8,500 feet long. Served by an ATCT, the airport is

a base to 143 fixed wing aircraft and provides a full range of FBO services.

Mesa Falcon Field Airport, located 29 nautical miles east of Glendale Municipal Airport, is owned and operated by the City of Mesa. The airport is supported by parallel runways oriented in a northeast-southwest direction. Runway 04R-22L provides the greatest length at 5,100 feet. An estimated 552 aircraft are based at the airport (most of which are single engine piston aircraft). The airport is served by a control tower, an on-site NDB, and a full range of FBO services.

Memorial Airfield is a private airport located 27 nautical miles southeast of Glendale Municipal Airport. The airport is served by a single runway (Runway 12-30) which is 8,577 feet in length. Approximately 15 aircraft are based at the airport.

Scottsdale Airport, located 20 nautical miles northeast, is owned and operated by the City of Scottsdale. The airport is served by Runway 3-21 (which is 8,251 feet long) and a control tower. Approximately 400 aircraft including 24 business jets are based at the airport.

Stellar Airpark is a privately owned airport open to public use. Located 24 nautical miles southeast of Glendale Municipal Airport, the airport is served by Runway 17-35, which is 4,005 feet long. Approximately 101 aircraft are based at the airport, including 86 single engine, five multi-engine, and nine helicopter aircraft.

Williams Gateway Airport, located 35 nautical miles southeast of Glendale

Municipal Airport, is owned and operated by the Williams Gateway Airport Authority. The airport is served by three parallel runways with 12R-30L providing the greatest runway length at 10,401 feet. The airport is a recently converted Air Force Base and plans currently call for the airport to serve air carrier, general aviation, and cargo operators.

Chandler Municipal Airport is located 29 nautical miles southeast of Glendale Municipal Airport. Owned and operated by the City of Chandler, the airport is equipped with two parallel runways, the longest 4,850 feet in length. Approximately 250 aircraft are based at Chandler Municipal Airport. The airport is served by a control tower, an on-site NDB, and a full-range of FBO services.

Buckeye Municipal Airport is located 21 miles southwest of Glendale Municipal Airport and is owned by the Town of Buckeye. Lauridsen Industrial Corporation has a long-term lease with the Town of Buckeye to operate and manage the airport. A single runway, 4,300 feet long, is available for use. Approximately 40 aircraft base at the airport.

Luke Air Force Base is located 5 nautical west of Glendale Municipal Airport and serves as a major tactical jet training base for the U.S. Air Force. Luke AFB is equipped with two parallel runways oriented in a northeast-southwest direction with one runway measuring 10,000 feet in length. While Luke AFB is closed to the public, the proximity of the base to Glendale Municipal Airport and the high level of

high-speed jet aircraft training impacts airspace and operations at Glendale Municipal Airport. Coordination with Luke AFB is essential in all proposed expansions of Glendale Municipal Airport.

Private airports ranging from dirt strips to full-service paved facilities are also located near the Glendale Municipal Airport. Stellar Airpark (previously discussed) is an example of a public-use airport which is privately owned. A number of others, however, restrict public use. These airports are illustrated on **Exhibit 1C**.

SOCIOECONOMIC CHARACTERISTICS

A variety of historical and forecast socioeconomic data, related to the regional area, was collected for use in various elements of this master plan. This information is essential in determining aviation service level requirements, as well as forecasting the number of based aircraft and aircraft activity at the airport. Aviation forecasts are normally directly related to the population base, economic strength of the region, and the ability of the region to sustain a strong economic base over an extended period of time. Historical population and employment data for the City of Glendale Metropolitan Planning Area (MPA), and per capita personal income, population, and employment data for Maricopa County has been collected for use in this study. This information was collected

from the Maricopa Association of Governments (MAG) and United States Department of Commerce.

POPULATION

Historical resident population in household estimates for the City of Glendale MPA and Maricopa County are summarized in **Table 1E**. Between 1990 and 1995, the resident household population in the Glendale MPA grew by 26,821, growing at an average annual rate of 3.1 percent. For Maricopa County, total resident household population grew by 392,700, growing at an average annual rate of 3.4 percent. Affordable quality homes, excellent educational institutions, and enjoyable recreational amenities have been attributed to the strong population growth in the City of Glendale.

EMPLOYMENT

Table 1F summarizes historical employment totals for the Glendale MPA and Maricopa County for the period from 1990 to 1995. Total employment has increased in both the Glendale MPA and Maricopa County. The Glendale MPA employment base is widely diversified and includes manufacturing, service, aerospace, communications, precision metal working and casting, chemicals, electronics, and warehousing industries. Honeywell and Luke AFB are some of Glendale's largest employers.

TABLE 1E
Historical Resident Population in Households
City of Glendale MPA, Maricopa County

	1990 ¹	1995 ²	Annual % Growth Rate
City of Glendale MPA	159,068	188,610	3.4
Maricopa County	2,130,400	2,528,700	3.5
¹ <i>Update of the Population and Socioeconomic Database for Maricopa County, Arizona;</i> Maricopa Association of Governments; March, 1993			
² <i>Maricopa Association of Governments; July, 1997</i>			

TABLE 1F
Historical Total Employment
City of Glendale MPA, Maricopa County

	1990 ¹	1995 ²	Annual % Growth Rate
City of Glendale MPA	50,430	62,802	2.1
Maricopa County	975,037	1,264,800	5.3
¹ <i>Update of the Population and Socioeconomic Database for Maricopa County, Arizona;</i> Maricopa Association of Governments; March, 1993			
² <i>Maricopa Association of Governments; July, 1997</i>			

INCOME

Table 1G compares the per capita personal income (PCPI) for Maricopa County, the State of Arizona, and the United States between 1970 and 1994. As illustrated by the table, the State of Arizona's PCPI has mirrored that of the United States. Arizona's PCPI ranked 38th in the country at 88 percent of the national average (\$21,696) in 1994. The average annual growth rate of Arizona's PCPI over the 24 year period

was 7.0 percent, while the nation's PCPI averaged 7.2 percent annual growth.

In 1994, Maricopa County had a per capita personal income of \$21,364. This PCPI ranked first in the State, and was 111.6 percent of the State average (\$19,147) and 98.5 percent of the national average (\$21,696). The average annual growth rate of PCPI over the 24 year period was 7.1 percent.

TABLE 1G
Historical Per Capita Personal Income
Maricopa County, State of Arizona, United States

	1970	1980	1990	1994	Annual % Growth Rate
Maricopa County	\$4,099	\$10,313	\$18,256	\$21,364	7.1
State of Arizona	\$3,777	\$9,272	\$16,225	\$19,147	7.0
United States	\$4,047	\$9,940	\$18,666	\$21,696	7.2

Source: U.S. Department of Commerce, Regional Economic Information System

SUMMARY

The information discussed on the previous pages provides a foundation upon which the remaining elements of the planning process will be constructed. Information on current airport facilities and utilization will serve as a basis, with additional

analysis and data collection, for the development of forecasts of aviation activity, and facility requirement determinations. The inventory of existing conditions is the first step in the complex process of determining those factors which will meet projected aviation demand in the community and region.

GLOSSARY

Included in the following pages are a number of terms with appropriate definitions to assist the reader in understanding the technical language included in this document.

Air carrier: an operator which: (1) performs at least five round trips per week between two or more points and publish flight schedules which specify the times, days of the week and places between which such flights are performed; or (2) transport mail by air pursuant to a current contract with the U.S. Postal Service. Certified in accordance with Federal Aviation Regulation (FAR) Parts 121 and 127.

Air taxi: An air carrier certificated in accordance with FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft "for hire" for specific trips.

Air traffic control tower (ATCT): a central operations facility in the terminal air traffic control system, consisting of a tower, including an associated IFR room if radar equipped, using air/ground communications and/or radar, visual signaling, and other devices to provide safe and expeditious movement of terminal air traffic.

Air route traffic control center (ARTCC): a facility established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the enroute phase of flight.

Approach lighting system (ALS): an airport lighting facility which provides visual guidance to landing aircraft by radiating light beams by which the pilot aligns the aircraft with the extended centerline of the runway on his final approach and landing.

Azimuth: horizontal direction or bearing; usually measured from the reference point of 0 degrees clockwise through 360 degrees.

Base leg: a flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline.

Compass locator (LOM): a low power low/medium frequency radio-beacon installed in conjunction with the instrument landing system at one or two of the marker sites.

Displaced threshold: a threshold that is located at a point on the runway other than the designated beginning of the runway.

Distance measuring equipment (DME): equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.

DNL: day-night noise level. The daily average noise metric in which that noise occurring between 10:00 p.m. and 7:00 a.m. is penalized by 10 times.

Downwind leg: a flight path parallel to the landing runway in the direction *opposite* to landing.

Duration: length of time, in seconds, a noise event such as an aircraft flyover is experienced. (May refer to the length of time a noise event exceeds a specified threshold level.)

Enplaned passengers: the total number of revenue passengers boarding aircraft, including originating, stop-over, and transfer passengers, in scheduled and non-scheduled services.

Fixed base operator (FBO): a provider of service to users of an airport. Such services include, but are not limited to, fueling, hangaring, flight training, repair and maintenance.

General aviation: that portion of civil aviation which encompasses all facets of aviation except air carriers holding a certificate of convenience and necessity, and large aircraft commercial operators.

Glide slope: electrical equipment that emits signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as an ILS, or visual ground aids, such as VASI, which provide vertical guidance for a VFR approach or for the visual portion of an instrument approach and landing.

Global positioning system (GPS): a navigational technology based on a constellation of satellites orbiting approximately 11,000 miles above the surface of the earth.

Ground effect: the excess attenuation attributed to absorption or reflection of noise by man-made or natural features on the ground surface.

Instrument approach: a series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually. It is prescribed and approved for a specific airport by competent authority.

Instrument flight rules (IFR): rules governing the procedures for conducting instrument flight. Also a term used by pilots and controllers to indicate type of flight plan.

Instrument landing system (ILS): a precision instrument approach system which normally consists of the following electronic components and visual aids: localizer, glide slope, outer marker, middle marker, and approach lights.

Localizer (LOC): providing horizontal guidance to the runway centerline for aircraft during approach and landing by radiating a directional pattern of radio waves modulated by two signals which, when received with equal intensity, are displayed by compatible airborne equipment as an "on-course" indication, and when received in unequal intensity are displayed as an "off-course" indication.

Localizer type directional aid (LDA): a facility of comparable utility and accuracy to a localizer, but is not part of a complete ILS and is not aligned with the runway.

Microwave landing system (MLS): an instrument approach and landing system that provides precision guidance in azimuth, elevation, and distance measurement.

Missed approach: an instrument approach not completed by landing. This may be due to visual contact not established at authorized minimums or instructions from air traffic control, or other reasons.

Non-directional beacon (NDB): a radio beacon transmitting non-directional signals that a pilot of an aircraft equipped with direction finding equipment can determine his/her bearing to or from the radio beacon and "home" on or track to or from the station. When the radio beacon is installed in conjunction with the instrument landing system, it is normally called a compass locator.

Nonprecision approach procedure: a standard instrument approach procedure in which no electronic glide slope is provided, such as VOR, TACAN, NDB, or LOC.

Operation: a take-off or a landing.

Outer marker (OM): an ILS navigation facility in the terminal area navigation system located four to seven miles from the runway edge on the extended centerline indicating to the pilot, that he/she is passing over the facility and can begin final approach.

Precision approach path indicator (PAPI): an airport lighting facility in the terminal area navigation system used primarily under VFR conditions. The PAPI provides visual descent guidance to aircraft on approach to landing through a single row of two to four lights, radiating a high intensity red or white beam to indicate whether the pilot is above or below the required approach path to the runway. The PAPI has an effective visual range of 5 miles during the day and 20 miles at night.

Precision approach procedure: a standard instrument approach procedure in which an electronic glide slope is provided, such as ILS.

Precision instrument runway: a runway having a existing instrument landing system (ILS).

Reliever airport: an airport to serve general aviation aircraft which might otherwise use a congested air-carrier served airport.

Vector: a heading issued to an aircraft to provide navigational guidance by radar.

Victor airway: a control area or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids.

Visual approach: an approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of an air traffic facility and having an air traffic control authorization, may proceed to the airport of destination in VFR conditions.

Visual approach slope indicator (VASI): an airport lighting facility in the terminal area navigation system used primarily under VFR conditions. It provides vertical visual guidance to aircraft during approach and landing, by radiating a pattern of high intensity red and white focused light beams which indicate to the pilot that he/she is above, on, or below the glide path.

Visual flight rules (VFR): rules that govern the procedures for conducting flight under visual conditions. The term **VFR** is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

VOR/Very high frequency omnidirectional range station: a ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the national airspace system. The VOR periodically identifies itself by Morse Code and may have an additional voice identification feature.

VORTAC/VHF Omnidirectional range/tactical air navigation: a navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance-measuring equipment (DME) at one site.

ABBREVIATIONS

AGL:	above ground level
ALS:	approach lighting system
ARTCC:	air route traffic control center
ATCT:	air traffic control tower
DME:	distance measuring equipment
DNL:	day-night noise level
DW:	runway weight bearing capacity for aircraft with dual-wheel type landing gear
DTW:	runway weight bearing capacity for aircraft with dual-tandem type landing gear
FAA:	Federal Aviation Administration
FAR:	Federal Aviation Regulation
FBO:	fixed base operator
GPS:	global positioning system
GS:	glide slope
IFR:	instrument flight rules (FAR Part 91)
ILS:	instrument landing system
LMM:	compass locator at middle marker
LOC:	ILS localizer
LOM:	compass locator at outer marker
MLS:	microwave landing system
MM:	middle marker
MSL:	mean sea level

NAVAID: navigational aid

NDB: non-directional beacon

OM: outer marker

PAPI: precision approach path indicator

SEL: sound exposure level

SW: runway weight bearing capacity for aircraft with single-wheel type landing gear

TRACON: terminal radar approach control

VASI: visual approach slope indicator

VFR: visual flight rules (FAR Part 91)

VHF: very high frequency

VOR: very high frequency omnidirectional range

VORTAC: (see VOR and TACAN)